

Graph the function.

1.  $f(x) = \frac{2x+3}{x-5}$

Vertical Asymptote(s):  $x=5$

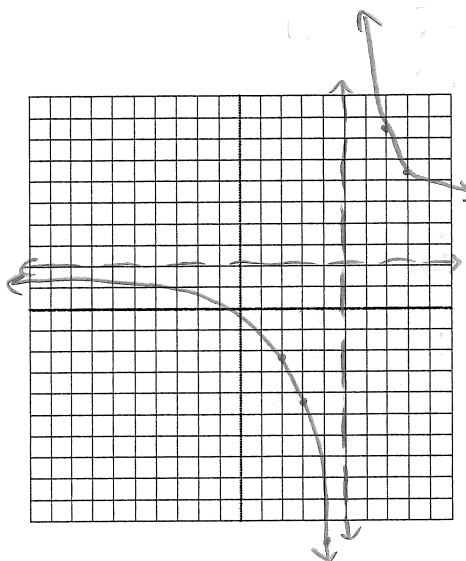
$x-5=0$

Horizontal Asymptote:  $y = \frac{2}{1} = 2$

Domain:  $\mathbb{R}$  except 5

Range:  $\mathbb{R}$  except 2

x	y
2	-2.3
3	-4.5
4	-11
5	
6	15
7	8.5
8	6.3



2.  $f(x) = \frac{5}{x^2+1}$

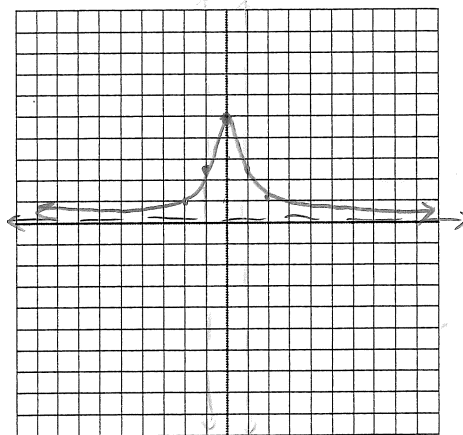
Vertical Asymptote(s): none

Horizontal Asymptote:  $y=0$

Domain:  $\mathbb{R}$

Range:  $\mathbb{R}$  except 0

x	y
-2	1
-1	2.5
0	5
1	2.5
2	1



Simplify the expression.

$$3. \frac{x-3}{2x-8} \cdot \frac{6x^2-96}{x^2-9}$$

$$= \frac{\cancel{(x-3)} \cdot 6(x^2-16)}{2(x-4) \cdot \cancel{(x-3)}(x+3)}$$

$$= \frac{\cancel{(x-4)}(x+4)}{\cancel{(x-4)}(x+3)} = \boxed{\frac{x+4}{x+3}}$$

$$5. \frac{5x}{x+8} + \frac{4x-9}{x^2+5x-24}$$

$$= \frac{5x(x-3)}{(x+8)(x-3)} + \frac{4x-9}{(x+8)(x-3)}$$

$$= \boxed{\frac{5x^2-11x-9}{(x+8)(x-3)}}$$

$$4. \frac{3x+27}{6x-48} \div \frac{x^2+9x}{x^2-4x-32}$$

$$= \frac{3\cancel{(x+9)}}{2\cancel{6}(x-8)} \cdot \frac{\cancel{(x-8)}(x+4)}{x\cancel{(x+9)}} = \boxed{\frac{x+4}{2x}}$$

$$6. \frac{x+2}{x^2+4x+3} - \frac{5x}{x^2-9}$$

$$= \frac{(x+2)(x-3)}{(x+3)(x+1)(x-3)} - \frac{5x(x+1)}{(x-3)(x+3)(x+1)}$$

$$= \frac{x^2-x-6-5x^2-5x}{(x+3)(x-3)(x+1)}$$

Solve the equation.

$$7. \frac{2}{x+2} \neq \frac{2}{2x+5}$$

$$2x+4 = 4x+10$$

$$-2x = 6$$

$$\boxed{x = -3}$$

$$= \frac{-(4x^2+6x+6)}{(x+3)(x-3)(x+1)}$$

$$= \boxed{\frac{-2(2x^2+3x+3)}{(x+3)(x-3)(x+1)}}$$

$$(x+1)(x-1)$$

$$8 \left( \frac{3x}{x+1} = \frac{12}{x^2-1} + 2 \right)$$

$$3x(x-1) = 12 + 2(x+1)(x-1)$$

$$3x^2-3x = 12 + 2x^2-2$$

$$x^2-3x-10=0$$

$$(x-5)(x+2)=0$$

$$\boxed{x=5 \quad x=-2}$$